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The origin of cirrus observed over tropical Paramaribo station (6N 55W)

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The origin of cirrus over Surinam is investigated, based on observations from SnowWhite (SW) chilled-mirror hygrometer sondes over the period October 2002 – November 2004. In total 28 SW launches were performed, of which 12 during a recent pilot study campaign (Oct-Nov 2004) in support of night-time Lidar observations with the MARL (Mobile Aerosol Raman Lidar, from the Alfred Wegener Institute in Bremerhaven, Germany). During this pilot study, concurrent wind and ozone profiles were also measured along with the SW sounding. The origin of cirrus is investigated using ECMWF back-trajectories and analyses, as well as infra-red images from METEOSAT and GOES12. It is found that cirrus events below the TTL can often be traced to deep convection inland over the Amazon region or to the ITCZ when it lies north of the South American continent. In contrast, cirrus occurring at or near the tropopause does not seem to have this link to deep convection and could therefore be a result of other mechanisms, like the Brewer-Dobson circulation. Local disturbances in the background wind field often accompany the occurrence of high-humidity layers or cirrus – pointing to a link with the thermal wind explanation offered by Fujiwara et al. (2003) and enhancement by inertial unstable circulation, as found in the upper troposphere by Fortuin et al. (2003).